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able to interpret a section correctly and to know when there is a glaring fault in his technique.—W. J. G. LAND.

**Illustrations.**—A series of lectures dealing with the illustration of botanical papers was delivered at the University College, London, in 1913, by T. G. HILL. In response to various requests, these lectures are now published in book form.<sup>10</sup> The various forms of intaglio, plane surface, and relief printing are described, and their limitations noted. Suggestions are given for the preparation of copy suited to the various types of reproduction. The descriptions of processes are interesting, and, combined with the practical hints, should enable investigators to furnish more effective copy. There is no effort to give instruction in drawing.—C. J. CHAMBERLAIN.

**North American Flora.**—The third part of Vol. 17 continues the presentation of the Poaceae, and includes the genus *Panicum* by HITCHCOCK,<sup>11</sup> who recognizes 211 species distributed among 46 tribes. No new species are described, but it is interesting to note that HITCHCOCK's name is associated with 32 of the species. Other diligent students of the species have been NASH (30 species), SCRIBNER (25 species), and ASHE (16 species).—J. M. C.

#### NOTES FOR STUDENTS

**Anthocyanins.**—WILLSTÄTTER<sup>12</sup> and his students have made an extensive study of the anthocyanins of various flowers and fruits. The findings are certain to prove of great importance to plant workers, especially breeders and physiologists. The work puts this previously little understood group of plant pigments among those most thoroughly worked. All such matters as methods of extraction, purification, and quantitative estimation, general chemical constitution, general chemical characters, empirical and structural formulae, and

<sup>10</sup> HILL, T. G., *The essentials of illustration*. 8vo. pp. xii+95. London: Wesley & Son. 1915.

<sup>11</sup> North American Flora 17:part 3. pp. 197-288. Poales: Poaceae (pars), by G. V. NASH and A. S. HITCHCOCK. New York Botanical Garden. 1915.

<sup>12</sup> WILLSTÄTTER, R., Über Pflanzenfarbstoffe. Ber. Chem. Gesells. 47:2831-2874. 1915; WILLSTÄTTER, R., and NOLAN, T. J., II. Über den Farbstoff der Rose. Ann. Chem. 408:1-14. 1914; WILLSTÄTTER, R., and MALLISON, H., III. Über den Farbstoff der Preiselbeere, *ibid.* 15-41; WILLSTÄTTER, R., and BOLTON, K., IV. Über den Farbstoff der Scharlachpelargonie, *ibid.* 42-61; WILLSTÄTTER, R., and MIEG, W., V. Über ein Anthocyan des Rittersporns, *ibid.* 61-82; WILLSTÄTTER, R., and ZOLLINGER, E. H., VI. Über die Farbstoffe des Weintraube und der Heidelbeere, *ibid.* 83-109; WILLSTÄTTER, R., and MARTIN, K., VII. Über den Farbstoff der *Althaea rosea*, *ibid.* 110-112; WILLSTÄTTER, R., and MIEG, W., VIII. Über den Farbstoff die wilder Malve, *ibid.* 122-135; WILLSTÄTTER, R., and NOLAN, T. J., IX. Über den Farbstoff die Päonie, *ibid.* 136-146; WILLSTÄTTER, R., and MALLISON, H., X. Über Varationen der Blütenfarben, *ibid.* 147.